

I Claim:

1. A multispectral imaging camera comprising;
  - a. A lens for transmitting an image;
  - b. A means for focusing said image, said means operably affixed to said lens;
  - c. An optical sensor to receive said image and separate said image into a plurality of bandwidth frequencies forming at least two data sets, each of said data sets comprising a plurality of linear data and said separated images having spatial and temporal registration with each other;
  - 10 d. A processing means for receiving said data sets and manipulating said linear data within said data sets producing modified data sets; and
  - 15 e. a monitor for displaying said modified data sets.
2. A multispectral imaging camera according to claim 1 wherein said camera further comprises a polarizing filter affixed on said lens polarizing said image.
3. A multispectral imaging camera according to claim 1  
20 wherein said camera further comprises a means for controlling the amount of light transmitted through said lens.
4. A multispectral imaging camera according to claim 1 wherein said optical sensor is a vertically stacked  
25 photodiode array based on the spectral absorption characteristics of silicon.
5. A multispectral imaging camera according to claim 1 wherein said bandwidth frequencies are selected from frequencies not less than 400 nanometers.
- 30 6. A multispectral imaging camera according to claim 1 wherein said bandwidth frequencies are selected from frequencies not more than 700 nanometers.

7. A multispectral imaging camera according to claim 1 wherein said processing means manipulates said data sets by performing at least a fixed pattern correction and a line differencing algorithm.
- 5 8. A multispectral imaging camera according to claim 1 wherein said processing means manipulates said data sets by performing at least a fixed pattern correction, a sensor linearity correction, a column readout correction, and a line differencing algorithm.
- 10 9. A multispectral imaging camera according to claim 7 wherein said processing means further manipulates said data sets by performing an image integration function.
10. A multispectral imaging camera according to claim 7 wherein said processing means further manipulates said data sets by performing a demeaning filter function.
- 15 11. A method for observing an object under the surface of water comprising the steps of:
  - a. separating an image into a plurality of bandwidth frequencies forming at least two data sets said separated images having spatial and temporal registration with each other;
  - 20 b. processing said image by manipulating said at least two data sets to enhance visualization of said object; and
  - c. displaying said manipulated data sets thereby observing said object under the surface of water.
- 25 12. A method according to claim 11 wherein said separating of said image into a plurality of bandwidth frequencies is by use of a vertically stacked photodiode array sensor based on the spectral absorption characteristics of silicon.
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13.A method according to claim 11 wherein said processing manipulates said at least two data sets by performing at least a fixed pattern correction and a line-differencing algorithm.

5 14.A method according to claim 12 wherein said processing means manipulates said at least two data sets by performing at least a fixed pattern correction, a sensor linearity correction, a column readout correction, and a line-differencing algorithm.

10 15.A method according to claim 11 wherein said processing means further manipulates said at least two data sets by performing an image integration function.

16.A method according to claim 11 wherein said processing means further manipulates said at least two data sets 15 by performing a demeaning filter function.

17.A method according to claim 11 wherein said bandwidth frequencies are selected from frequencies not less than 400 manometers.

18.A method according to claim 11 wherein said bandwidth 20 frequencies are selected from frequencies not more than 700 nanometers.

19.A method according to claim 11 wherein said image being separated into a plurality of bandwidth frequencies is polarized.